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a plurality of photodetectors disposed relative to one another to form an array on said substrate, each photodetector having first and second quantum well structures, one stacked over the other and each comprising a plurality of alternating barrier layers and well layers, each well layer of each quantum well structure coupled between two barrier layers to support an intersubband transition between a bound ground energy state and an excited energy state within a common energy band where said excited energy state is substantially resonant with an energy of the well top,

D1 Cont'd

wherein materials, thicknesses and dimensions of said well layers and barrier layers are selected such that said first and said second quantum well structures effect intersubband transitions at first and second wavelengths, respectively, wherein none of said two quantum well structures is short circuited.

D2 Amdt

14. (Amended) A QWIP as in claim 1 further comprising a random reflector formed on said substrate to reflect incident radiation to said photodetectors.

16. (Amended) A QWIP as in claim 1 wherein said excited energy state is substantially resonant with an energy of the well top and has a deviation from said well top by less than about 2% of the well top.--

Please add the following new claims:

--36. A QWIP as in claim 1, further comprising:

a first contact layer formed over said substrate in each photodetector, wherein said first quantum well structure is formed on said first contact layer;

a second contact layer formed over said first quantum well structure in each photodetector;

a first electric contact connected to said second contact layer to output a signal caused by absorption of radiation at said first wavelength by said first quantum well structure;

a third contact layer formed over said second quantum well structure; and

a second electric contact connected to said third contact layer to output a signal caused by absorption of radiation at said second wavelength by said second quantum well structure.--

--37. A QWIP as in claim 36, further comprising a multiplexer coupled to said first and said second electric contacts in each photodetector in said array and simultaneously generating a stream of data caused by radiation at said first wavelength and a stream of data caused by radiation at said second wavelength, so as to separately and simultaneously form images of said first and second wavelengths.--

D2

Concl'd

--38. A QWIP as in claim 1, wherein well layers of one quantum well structure include GaAs and well layers of another quantum well structure include InGaAs.--

--39. A QWIP as in claim 1, wherein well layers of one quantum well structure include GaAs and well layers of another quantum well structure include AlGaAs.--